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Время выполнения задания – 180 мин.

Прочитайте статью[1] и сделайте её критический анализ на русском языке.

1. Introduction

Organizations today face uncertainty, rapid environmental changes, globalization and increasing complexity in their work tasks. One way of adapting to such conditions is to organize different kinds of work using a team-based structure *(Ehrhadt et al., 2014)*. The logical reasons underlying the use of these cross-functional teams are that, when the experts, as representatives of all the relevant areas are gathered together, the team's decisions will likely be able to cover a wide range of perspectives and issues, which may affect the success of their collective efforts *(Van Der Vegt, Bunderson, 2005)*. Therefore, creating a multidisciplinary management team is attractive to the organizations, because the individuals in an organization have different information, knowledge and skills to use for solving the issues or complex problems that arise *(Van Der Vegt, Bunderson, 2005)*. On the other hand, this heterogeneity of knowledge and the background of the team members, in response to the dynamic environment and the solving of problems, creates a cross-functional team that has a very high degree of ambiguity *(Daspit et al., 2013)*.

Intra-firm causal ambiguity is defined as a lack of understanding of the logical causal relationship between action and outcome, input and output, cause and effect, the factors of production and how they interact with each other, as well as between competence and competitive advantage *(Alvares, Antolin, 2005; King, Zeithalm, 2001; Szulanski, 1996)*. This has been declared one of the barriers to performance, as it is a variable which prevents the learning *(Huber, 1991)* and transfer of knowledge *(Kogut, Zander, 1993; Simonin, 1999; Szulanski, 1996)*. In the context of cross-functional teams, the lack of understanding of the causal relationship between inputs and outputs, or the factors that contribute to the success or failure of a project cause the team to fail to understand the project's objectives, with regard to the details of the process of the project, the project's needs and the knowledge management for it *(Potter, Lawson, 2013)*.

Enriching these issues, this study focuses on the impact of intra-firm causal ambiguity on performance at the team level, in particular on cross-functional teams working on projects that require creativity.

Another interesting issue is related to performance. Assessing it is of extreme importance to everyone involved, but it is the least agreed upon variable *(Shenhar, Levy, 1997)*. Since the previous studies were focusing on the dynamic environment faced by organizations, and the work of cross-functional teams, we tended to examine the dynamic within the process of achieving the performance, rather than the output of the project's team. Under the approach of knowledge-based view (KBV), and in the context of creative cross-functional teams, the basic premise of the KBV about teams' performances is that the main function of a company's ability is to manage, maintain and create knowledge, so that an atmosphere of creativity exists, allowing for the growth of ideas for new products *(Grant, 1996)*. As performance measurements are complex, we offer two measures of

[1] Подготовлена на основе: Suprapto Y.L., Wibowo A., Harsono H. Intra-firm causal ambiguity on cross-functional project team's performance: Does openness and an integrative capability matter? // *International Journal of Managing Projects in Business*. 2018. 11(4). P. 901-912.

performance, namely, efficiency and effectiveness. These two measures are usually mutually exclusive *(Griffis et al., 2004)*. Efficiency is the measure of how well the resources expended are utilized, while effectiveness is the extent to which the goals are accomplished *(Fugate et al., 2010)*.

The results of research into the impacts of intra-firm causal ambiguity on the organizational performance are still inconsistent. Some researchers claim that intra-firm causal ambiguity has a negative effect on performance *(Alvares, Antolin, 2005; Potter, Lawson, 2013)*, but there are also studies that show the opposite result *(Mosakowski, 1997)*. This research accommodates these inconsistencies by examining the effects of a moderating variable on the impact of intra-firm causal ambiguity on a cross-functional team's performance, in its contextual and internal aspects. The contextual aspect is represented by the openness of the team, while the team's ability to integrate the diversity of knowledge, i.e. its integrative capability, is represented as the internal aspect.

The setting of this study focuses on cross-functional teams that are required to think and work creatively when running projects, such as for the development of products or services, marketing and human resources' development. Such teams are required to produce products, services or activities in response to their dynamic environment/market. The fast changes in technology and the marketplace create complexities which organizations constantly face when developing new projects or marketing initiatives. The inability to recognize and manage these complexities can lead to the projects' failure *(Kim, Wilemon, 2007)*.

2. Literature review and hypotheses development

The impact of causal ambiguity on cross-functional project teams' performance

Projects which are carried out by cross-functional teams involve individuals with different portfolios of knowledge, and require high-quality knowledge management *(Tsai et al., 2012)*. Thus, the management of the heterogeneous knowledge greatly affects its performance *(Tsai et al., 2012)*.

A lack of understanding of the causal relations between inputs and outputs, or the factors that contribute to the success or failure of a project, could mislead the project's manager. This, in turn, will have an impact on all the members of his/her team, in their understanding of the project's objectives associated with the detailed processes of the project, the needs of the project and the management of the knowledge of the project. This would hamper the mobility factor, reducing the portion of the shared knowledge, restricting the transfer of best practices and inhibiting the release of any internal stickiness in the project *(Potter, Lawson, 2013)*. Under these conditions, the organization will find it difficult to obtain any added value from the project's results and decrease efficiency and effectiveness. Based on these statements, authors built their hypotheses:

***H1a**: Intra-firm causal ambiguity negatively affects cross-functional project teams'efficiency.*

***H1b**: Intra-firm causal ambiguity negatively affects cross-functional project teams'effectiveness.*

Team openness as the moderating variable

At the team level, the project team's members often face difficulties in articulating the proper relationship between science, technology and the results of the project itself (they experience intra-firm causal ambiguity) *(Bstieler, Hemmert, 2010)*.

Learning in the context of the team is a behavioral process, involving dynamic interactions and the exchange of ideas between the work team's members *(Kozlowski, Bell, 2008; Kozlowski, Ilgen, 2006)*, and between people in a different team comprised of other parties outside the team *(Uzzi, Lancaster, 2003)*. The good learning processes within the organization itself can be achieved because of the psychological sense of safety that grows from good quality interpersonal relationships *(Carmeli et al., 2009)*. The good quality of these interpersonal relationships can be

built through openness *(Wu et al., 2013)*. Openness is seen as cultural and encouraging or supportive behavior that is embodied in cross-functional cooperation, and a willingness to share information or knowledge *(Bond et al., 2004; Morrison, 1993)*. The hypotheses built on the explanation above are the following:

***H2a**: Openness moderates the impact of intra-firm causal ambiguity on the efficiency performance of cross-functional project teams. The higher openness in a team will cause the rate of intra-firm causal ambiguity to decrease, and improve the project team's efficiency performance.*

***H2b**: Openness moderates the impact of intra-firm causal ambiguity on the effectiveness performance of cross-functional project teams. The higher openness in a team will cause the rate of intra-firm causal ambiguity to decrease, and improve the project team's effectiveness performance.*

Integrative capabilities as the moderating variable

The cross-functional project teams have patterns of systems and subsystems which are interconnected. An inability to recognize and manage the complexities (encountered during intra-firm causal ambiguity) can cause the failure of the project's goal, consequently it is important that integrative capabilities are possessed by the team when running a project. According to Mitchell's *(2006)* the role of integrative capabilities in the relationship between intra-firm causal ambiguity and cross-functional project team's performance is as follows: the ability to integrate internal knowledge; and the ability to access external knowledge. Based on the explanation above, the authors built the following hypotheses:

***H3a**: Integrative capability moderates the impact of intra-firm causal ambiguity on the efficiency performance of cross-functional project teams. The higher integrative capability in a team will decrease the rate of intra-firm causal ambiguity and improve the project team's efficiency performance.*

***H3b**: Integrative capability moderates the impact of intra-firm causal ambiguity on the effectiveness performance of cross-functional project teams. The higher integrative capability in a team will decrease the rate of intra-firm causal ambiguity and improve the project team's effectiveness performance.*

3. Research Method

Sample and data collection

The population in this study is teams that come from a variety of companies which work with cross-functional teams or matrices, such as advertising agencies, recreational or amusement parks, television companies, production houses, radio stations, private education providers, manufacturing enterprises and IT companies. The sample population was chosen based on their tendency to form creative teams to respond to environmental/market dynamics by involving employees from different backgrounds and levels in the planning and implementation of projects. Rather than collecting data through other methods, such as experiments and secondary data collection, a survey was considered appropriate, considering that this study is looking for the experiences of the respondents in responding to the dynamic environment. In addition, as previously stated by another study *(Baughn et al., 1997)*, the critical issues of learning can be better captured by studying the daily activities performed by managers and their subordinates.

Since the unit of analysis of this research is at the team level (group), thus each team will be represented by its manager/leader and a minimum of two other members of the team, as the respondents.

The questionnaires which were given to 62 teams. Out of the 62, 56 teams responded, however, only 50 were deemed appropriate for further analysis. The characteristics of the respondents are that their teams have less than ten people (90.00 percent), a project work period of

four to six months (32.00 percent), and any projects that have already been started are less than three months old (46.00 percent).

Measurement

Intra-firm causal ambiguity in this study combines two sub-factors (the ambiguity of knowledge and the ambiguity of the project) which were adapted from previous research *(Potter, Lawson, 2013)*. The ambiguity of the knowledge sub-factor asked the respondents about the ambiguity of the knowledge being transferred from the donor, which is the knowledge transfer between the members of the team. The ambiguity of the project sub-factor assessed the level of ambiguity which is present in the project itself *(Szulanski, 1996)*. Examples of the items are "I understand how certain actions/activities performed by team members influence a particular output/outcome," and "The knowledge and competence of team members, related to their contribution to the project can be easily understood." The project performance of a cross-functional team is measured using an instrument from Petersen et al. *(2003)*. The question posed to respondents was to assess whether the project is effective (relatively, according to the purpose of its internal organization, the project's objectives and also the quality standards and technical goals) and efficient (according to the schedule, and budget costs targeted) with items such as "This project meets the established quality standards"; and "This project is in accordance with budgeted costs."

Openness is defined as the type of open culture within the team, which manifests itself in cross-functional cooperation and openness in sharing information or knowledge *(Wu et al., 2013)*. Openness is measured by two dimensions: first, how often team members from various functions work together to interpret the strategic information; second, the extent to which the project's team members can identify the various abilities of other team members from different departments/functions.

Integrative capability includes the access to external knowledge's integration or transfer from external-to-internal sources, and internal knowledge's integration or internal transfer between team members which affects the project's development system.

Responses to all the variables above were measured using a 1–5 scale from "strongly disagree" to "strongly agree," and in an attempt to eliminate any alternative explanation, a control variable, namely, the length of time the project has been running was employed.

4. Results

Data aggregation

As the unit of analysis of this research is the team (group), a score or value for each team is obtained from the average score of the respondents in that team. The aggregated data should be able to meet the justification of the following criteria: inter-rater agreement or the homogeneity of the group (RWG). The critical value for RWG is $\geqslant 0.07$; the difference between the teams (groups). The difference between groups is shown by the measurement of the inter-rater reliability which is denoted by the interclass correlation coefficients (ICC). ICC (1) represents the number of variants at the individual level, described by the group's membership. ICC's standard value (1) is 0–0.5 which means that the variance between the teams is greater than the variance within the team. ICC (2) represents the reliability of the average group. The value of ICC (2) that is required to be met is W0.06. Based on the above criteria, the final 49 teams are considered as having met the benchmarks.

Data analysis

Data analysis is presented in the Tables 1–5. Table 1 shows the results of Descriptive statistics.

Table 1

Descriptive analysis

Variable	Mean	SD	1	2	3	4	5	6
1. Efficiency	3.73	0.51	1	0.66**	−0.24	−0.28	0.28	0.39**
2. Effectiveness	3.80	0.38		1	−0.21	−0.26	0.36*	0.41**
3. Duration of project	1.77	0.89			1	−0.07	−0.07	0.03
4. Causal ambiguity	1.65	0.35				1	0.02	−0.27
5. Openness	3.75	0.54					1	0.38**
6. Integrative capability	4.13	0.38						1

Notes: * < 0.05; ** < 0.01

The method of analysis used for this study is a simple linear regression to test H1a and H1b, and a moderated regression analysis to test H2a–H3b. From Table 2, using efficiency as the dependent variable, it can be concluded that the control variable (duration of the project) does not significantly influence the project's efficiency, shown in Model 1.

Model 2 shows that intra-firm causal ambiguity significantly effects the project's efficiency ($\beta = -0.30$; $p < 0.05$). Model 3 shows that openness also significantly influences efficiency ($\beta = 0.27$; $p > 0.05$). Model 4 shows that the moderating effect of openness on the effect of the intra-firm's causal ambiguity on the project's efficiency shows a significant effect ($\beta = 1.8$; $p > 0.05$).

Table 2

Hypotheses testing using openness as the moderating variable and efficiency as the dependent variable

Variable	Model 1	Model 2	Model 3	Model 4
Duration of project	−0.24	−0.26	−0.24	−0.26
Causal ambiguity		−0.30*	−0.302*	−1.81*
Openness			0.27*	−0.67
Openness moderating				1.80*
R^2	0.06	0.15	0.22	0.28
ΔR^2		0.09	0.07	0.06
F-value	2.94	3.97*	4.20*	4.39**

Notes: * < 0.05; ** < 0.01

Table 3 shows the results of data analysis using effectiveness as the dependent variable. The duration of the project, as the control variable, does not significantly influence effectiveness. Intra-firm causal ambiguity – as shown in Model 2 – significantly influences project effectiveness ($\beta = -0.28$; $p < 0.05$). Model 3 indicates that openness also significantly influences effectiveness ($\beta = 0.34$; $p > 0.05$). As shown in Model 4, the moderating effect of openness on the effect of intra-firm's causal ambiguity on the project's effectiveness, shows a non-significant effect ($\beta = 0.62$; $p < 0.05$).

Table 3

Hypotheses testing using openness as the moderating variable and effectiveness as the dependent variable

Variable	Model 1	Model 2	Model 3	Model 4
Duration of project	−0.21	−0.23	−0.21	−0.21
Causal ambiguity		−0.28*	−0.28*	−0.79
Openness			0.34*	0.03
Openness moderating				0.62
R^2	0.04	0.12	0.24	0.25
ΔR^2		0.08	0.12	0.01
F-value	2.21	3.15*	4.70**	3.60*

Notes: * < 0.05; ** < 0.01

Table 4 shows the model of regression using efficiency as the dependent variable. Model 1 indicates that the control variable (duration of project) does not have an effect on efficiency. Intra-firm causal ambiguity as the independent variable significantly influences the efficiency of the project ($\beta = -0.30$; $p < 0.05$), as shown in Model 2. Integrative capability does not have an effect on efficiency, as shown in Model 3. As seen in Model 4, the moderating effect of integrative capability on the effect of intra-firm's causal ambiguity on the project's efficiency shows a non-significant effect.

Table 4

Hypotheses testing using integrative capability as the moderating variable and efficiency as the dependent variable

Variable	Model 1	Model 2	Model 3	Model 4
Duration of project	−0.24	−0.26	−0.27	−0.24
Causal ambiguity		−0.30*	−0.21	2.30
Integrative capability			0.34	1.43
Integrative capability moderating				−2.46
R^2	0.06	0.15	0.25	0.28
ΔR^2		0.09	0.10	0.03
F-value	2.93	3.97*	5.10**	4.34**

Notes: * < 0.05; ** < 0.01

The results of data analysis using effectiveness as the dependent variable are shown in Table 5. Duration of the project as the control variable does not significantly influence effectiveness. Intra-firm causal ambiguity – as shown in Model 2 – significantly influences project effectiveness ($\beta = -0.27$; $p < 0.05$), supporting H1b. Model 3 indicates that integrative capability also significantly influences effectiveness ($\beta = 0.37$; $p > 0.05$). As shown in Model 4, the moderating effect of integrative capability on the effect of intra-firm's causal ambiguity on the project's effectiveness shows a non-significant effect. Thus, H3b is not supported by the data.

Table 5

Hypotheses testing using integrative capability as the moderating variable and effectiveness as the dependent variable

Variable	Model 1	Model 2	Model 3	Model 4
Duration of project	−0.21	−0.23	−0.23	−0.22
Causal ambiguity		−0.27*	−0.18	1.57
Integrative capability			0.37**	1.13
Integrative capability moderating				−1.71
R^2	0.04	0.12	0.25	0.26
ΔR^2		0.08	0.13	0.01
F-value	2.21	3.15*	4.95**	3.92**

Notes: * < 0.05; ** < 0.01

5. Discussion

Hypothesis are supposed or rejected during the research.

A practical implication based on the research that has been done is that, when the condition of intra-firm causal ambiguity occurs, strategies to reduce the condition are needed. First, before a project starts, all the team members must understand the systemic. process of the project's resources related to the environment and the objectives. Systemic understanding of the resources system can help the team to effectively manage any causal ambiguity in the resources system *(Huh et al., 2013)*. Second, referring to the research of Zollo and Winter *(2002)*, who said that the higher the intra-firm causal ambiguity is, the efforts to codify the resources and the systemic process of the project should also be higher as well. So the second strategy is to codify/create tools that guide the project, in order to make it easily understandable, accessible and always up to date, over the lifespan of the project.

Вопросы для размышления

1. Опишите свое понимание ключевых терминов статьи «intra-firm causal ambiguity», «integrative capability», «team openness». Определите, в чем состоит научная проблема исследования и обоснованы ли гипотезы для тестирования предположений, сформулированных автором. Прокомментируйте свое отношение к ним.

2. Опишите методологию исследования, используемую в статье. Каким образом измеряли переменные? Какие переменные были выбраны в качестве независимых и зависимых переменных в модели исследования? Какие переменные выполняли модерирующую функцию?

3. Какие инструменты математической статистики были использованы для проведения исследования? Прокомментируйте назначение и сущность показателей R-квадрат, F-value, уровни значимости и другие показатели, описанные в таблицах задания.

4. Прокомментируйте результаты тестирования гипотез. Какие гипотезы были приняты, а какие отвергнуты? Проиллюстрируйте свое мнение данными из таблиц – результатов проведенного статистического анализа.

5. Сделайте выводы о полученных результатах исследования. По Вашему мнению, как можно интерпретировать полученные результаты? Связаны ли эти результаты с характером изучаемой выборки – проектных команд в, преимущественно, «креативных» индустриях»? Можно ли на примере полученных результатов проиллюстрировать взаимосвязь выявленных факторов с успешностью проектов?